

## REMARKS

Claims 71-73, and 75-78 are pending. Claims 34-58, 65-70, 74, and 79-103 have been canceled without prejudice. Claims 34-58, 65-70, 74, and 79-103 have been canceled as being drawn to a non-elected invention. The Applicants expressly reserve the right to prosecute in subsequent divisional applications or continuing applications or both claims covering the subject matter of the claims canceled. 35 U.S.C. §§ 120-121.

Claims 71 and 75 have been amended and new claims 104-106 have been added. Support for the new claims and claim amendments can be found throughout the application, including the originally-filed claims. For example, support for the amendments and new claims 104-106 can be found on page 15 of the specification, lines 7-15, and in the Examples. Importantly, no new matter has been added to the claims. The amendment to the claims should not be construed to be an acquiescence to any of the rejections. The amendments to the claims are being made solely to expedite the prosecution of the above-identified application. The Applicant reserves the right to further prosecute the same or similar claims in subsequent patent applications claiming the benefit of priority to the instant application. 35 USC § 120.

### **Objection to the Disclosure**

The Examiner has maintained her objection to the disclosure because the meaning of the abbreviations PPCS, TPPCS, BPCS, and BTCS is not expressly given in the specification. The Applicants wish to point out that this is an objection to the disclosure and not a rejection of the claims (no abbreviations appear in the claims) and that several attempts have been made to address this issue.

In Applicants' response dated January 26, 2004, the Applicants attempted to amend the specification to include definitions stating what the abbreviations stand for. In the following office action dated May 5, 2004, the Examiner objected to the amendment saying that it introduced new matter. In Applicants' subsequent response dated November 5, 2004, the Applicants removed the definitions.

The Applicants feel they have to address the Examiner's statement on page 6 of the outstanding office action stating that "[t]he chemical names previously inserted in the specification for PPCS, BPCS, TPPCS and BTCS were subsequently deleted *since there was insufficient evidence provided to demonstrate that one of ordinary skill in the art at the time of the invention would have understood the abbreviations to have the purported meaning*" (emphasis added). The Applicants do not know what the Examiner is basing this contention on, and think that it is a mistake to make of record a comment directed to the Applicants' motivation for removing the definitions. In the same response that the definitions were deleted, the Applicants clearly state that "[t]he Applicants respectfully disagree with this objection (*that the definitions constitute new matter*), however, solely to expedite the prosecution of the present application, the Applicants have amended the specification to remove the definitions for PPCS, TPPCS, BPCS, and BTCS..." Clearly, the definitions were removed to expedite prosecution and not because of insufficient evidence that one of ordinary skill in the art would know what they stood for.

However, the Applicants appreciate the situation that the Examiner is in, and that the Examiner's goal is clarity. To avoid any confusion from past statements, the Applicants have made of record the definitions of PPCS, TPPCS, BPCS, and BTCS, by including the definitions in the accompanying Declaration under 37. C.F.R. § 1.132 signed by Dr. Randall Alberte who is listed as an inventor on the current application. Please see paragraph 9 for the following definitions.

The abbreviation PPCS stands for 4-pentylphenyl chlorosulfate (listed on page 2, line 23, of the specification as a particularly preferred compound).

The abbreviation TPPCS stands for 4-t-pentylphenyl chlorosulfate (listed on page 2, line 22, of the specification as a particularly preferred compound (note: amyl and pentyl are synonymous)).

The abbreviation BPCS stands for p-iso-butylphenyl chlorosulfate (listed on page 2, line 21, of the specification as a particularly preferred compound).

The abbreviation BTCS stands for p-t-butylphenyl chlorosulfate (listed on page 2, lines 21-22, of the specification as a particularly preferred compound).

The Applicants contend that it would not be new matter to amend the specification to include these definitions since the abbreviations and compounds were present in the application as originally filed, and that it is well established that Applicants may be their own lexicographers. However, since the Examiner has already indicated that she does not agree with this view, and solely to expedite prosecution, the Applicants respectfully submit that they have made of record the definitions of the above abbreviations by including them in the aforementioned Declaration, and respectfully request the withdrawal of the objection to the specification based on the abbreviations PPCS, TPPCS, BPCS, and BTCS.

**Rejection of Claims Under 35 U.S.C. § 112, ¶1**

Claims 71-73 and 75-78 stand rejected under 35 U.S.C. § 112, first paragraph, based on the Examiner's contention that although they are enabled for the examples disclosed, they are not enabled for the genus of compounds as represented by formulas 2 and 3, or for the scope of such terms as "coating," "plant surface," and "anti-fouling." The Applicants respectfully traverse this rejection.

The Applicants submit that the claims as amended are enabled by the specification because of the unique mechanism by which the anti-fouling coatings of the present invention work. To further support this contention, the Applicants submit the previously mentioned Declaration by Professor Randall Alberte. The Applicants would like to address the points raised by the Examiner in her final office action dated April 6, 2005.

**"Compounds"**

The Examiner contends that there are numerous compounds encompassed by the general structures (according to the Examiner, 72 for formula 2 in claim 71) defined in the claims which contribute to the overly broad scope of the claims. The Applicants traverse this contention.

The Applicants submit that over several correspondences with the Examiner, including the present one, the Applicants have steadily limited the scope of compounds covered by formulas 2 and 3 to where Z is only aryl or an alkyl homolog of aryl (i.e.  $-(CH_2)_m-R_{80}$ , wherein  $R_{80}$  is aryl); Y is O or two other elements within the same column as O in the periodic table of

the elements; and X is OH or a halide. The Applicants have optionally included substitutions on “Z” in formulas 2 and 3 with common organic groups to prevent easy design arounds and ensure the scope of coverage that they are entitled to.

The Applicants also submit that the specification includes examples where Z is aryl (*see* Example 1 for zosteric acid, where Z is a substituted aryl, and PPCS, TPPCS, BPCS, and BTCS, in Figure 3 which are all substituted aryls (*see* paragraph 9 of the Declaration)), and that the Declaration on page 2 contains additional examples where Z is a substituted aryl. The Applicants would also like to reiterate a point made earlier in the prosecution process that the experiments presented on pages 42-50 of the specification show that it is the  $-YS(O)_2X$  moiety that imparts the anti-fouling properties to the system or coating, and that compounds comprising this moiety can tolerate a wide variety of Z moieties and still be effective at preventing biofouling. For instance, see page 24, the second full paragraph, of the specification where it is reported that similar compounds lacking the sulfate ester group (e.g. cinnamic acid, ferulic acid, coumaric acid) do not show anti-fouling properties.

The Applicants submit that the scope of the genus of compounds represented by formula 2 in claim 71 and formula 3 in claim 75 is enabled by the specification and the supporting Declaration submitted herein.

#### “Coating”

The Examiner contends that the term “coating” is overly broad and encompasses numerous compositions. The Examiner points to the definition of coating included in the specification which encompasses gas, vapor, liquid, paste, semi-solid or solid, and that examples include sprays, liquids, gases, vapors, gel, powders, waters, wetters, detergents and oils. The Applicants traverse this contention.

Independent claims 71 and 75 have been amended to limit the type of coating to a liquid or solid coating comprising water, an organic polymer, lipid, fat, carbohydrate, wax, inorganic oxide, or silicone polymer. Support for the amendments can be found on page 15 of the specification, lines 7-15, and in the Examples. Additionally, the Applicants direct the Examiner’s attention to paragraph 7 and Exhibits 4-6 of the Declaration where it is stated and shown that the coatings of the present invention can comprise a wide variety of materials. As

non-limiting examples, the coatings can comprise PDMS silicone (a silicone polymer and also an inorganic oxide), epoxy, rosin, acrylate, polyesters, mixtures of epoxy, acrylates, polyesters, and rosins, plastics (polyethylene, polycarbonate, polypropylene, latex), glass (an inorganic oxide), and hydroylapatite (tooth enamel). The Applicants submit that the claims as amended are fully enabled by the specification because the claims comprise coatings of certain compositions which are further supported by the Declaration

#### “Plant Surface”

The Examiner contends that the term “plant surface” is overly broad because it encompasses numerous types of plants. The Examiner points to page 11 of the specification where a “plant” refers to any member of the plant kingdom, at any stage of its life cycle from seed to mature plant. The Applicants traverse this contention.

The Applicants direct the Examiner’s attention to paragraph 6 and Exhibit 2 of the Declaration where the mechanism by which antifouling coatings of the present invention work is disclosed. It is apparent from the mechanism that the actual plant comprising the coating is not key to making or using the present invention. Because the fouling organisms never make it past the coated surface, the coating of the present invention can work on a wide variety of plants. Exhibit 7 of the Declaration further supports the Applicants’ contentions by showing that the anti-fouling coatings of the present invention provide protection for plant surfaces including leafy plants and vegetables. The Applicants submit that one of ordinary skill in the art would be able to make and use the claimed coatings as amended because it is the coating and not the actual plant being coated that is important.

#### “Anti-fouling”

The Examiner also contends that the data presented in the specification are insufficient to demonstrate any predictability with respect to how each of the compounds encompassed by the general structures defined in the present claims would function in an anti-fouling capacity against any one of thousands of possible organisms such as bacteria, viruses, protists, algae or fungi if used on a plant.

The Applicants wish to repeat that the unique mechanism by which the anti-fouling coatings of the present invention work justifies the scope of the present claims. The coatings

prevent fouling agents from adhering to a surface (see Exhibit 2 of the Declaration). Adhering to a plant is the first step by which all fouling agents act upon a plant. If they don't stick to the plant they can't foul the surface. The Applicants direct the Examiner's attention to paragraph 8 and Exhibits 3-4 of the Declaration for a long list of fouling agents that the compounds of the present invention have been tested against. One can see by the variety of fouling agents listed that by preventing adherence, the compounds are effective against an incredible range of fouling agents. As non-limiting examples, from paragraph 8 and Exhibits 3-4 of the Declaration, the species of fouling agents that have been effectively treated with the coatings of the present invention include algae, bacteria, viruses, slimes, molds, all of which are types of protists, and upon which the Examiner has based her contention that the term "anti-fouling" is too broad. Therefore, the Applicants submit that the scope of the present claims is enabled by the specification and further supported by the Declaration.

Accordingly, withdrawal of the rejections under 35 U.S.C. 112, first paragraph, is respectfully requested.

#### **Miscellaneous**

The Examiner, although not making an objection or rejection, contends that the claims have not been limited as intended by the Applicants because terms such as "heteroaryl" and "heterocyclyl" in claims 71 and 75 have overlapping meaning. Although the Applicants traverse this contention because one of ordinary skill in the art would recognize that "heteroaryl" and "heterocyclyl" have distinct meanings, the Applicants submit that the issue has been rendered moot by the current set of amendments which narrow the definition of Z to aryl or  $-(CH_2)_{m-R_{80}}$  wherein  $R_{80}$  is aryl.

#### **Fees**

The Applicants believe they have provided for any required fees in connection with the filing of this paper. Nevertheless, the Director is hereby authorized to charge any additional required fee to our Deposit Account, **06-1448**.

### Conclusion

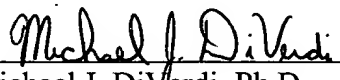
In view of the above amendments and remarks, the Applicants believe that the pending claims are in condition for allowance. If a telephone conversation with Applicant's Attorney or Agent would expedite prosecution of the application, the Examiner is urged to contact the undersigned.

Respectfully submitted,  
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